Weebit Nano Limited

Successfully scales down to 40nm resolution

Weebit Nano (ASX:WBT) announced it has successfully scaled down its SiOx ReRAM cells to a resolution (circuitry linewidth) of 40nm. The company was able to confirm that individual memory cells behaved similarly to SiOx ReRAM cells manufactured at 300nm.

WBT achieved this target within two years and one month ahead of schedule due to the use of standard materials and tools, used in commercial semiconductor fabs today. The collaboration with Leti in France also contributed to this fast development and will likely have limited WBT's spend to achieve this milestone.

40nm is a key milestone in memory development

The 40nm node is important for emerging memory technologies given that today's 3D NAND Flash memory chips are manufactured at a 40nm resolution. Therefore, WBT achieving 40nm with SiOx ReRAM indicates that this technology is feasible from a resolution standpoint.

However, the key benefits of ReRAM compared to Flash memory are speed (up to 1,000x faster than Flash), endurance (at least 100,000 program/erase cycles versus maximum 10,000 for SLC Flash), and energy consumption (<3v switching voltage for ReRAM6 versus >10v for Flash). SiOx ReRAM now offers all these advantages at the same resolution as today's Flash.

Suitable for existing applications and emerging edge computing

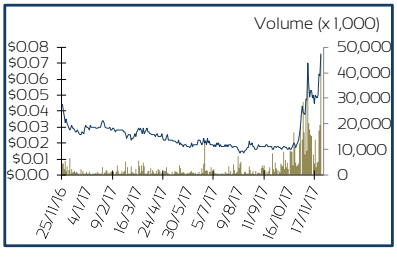
These performance characteristics, combined with a 40nm resolution, position SiOx ReRAM in between DRAM and Flash memory applications, i.e. we see areas of application for SiOx ReRAM in embedded memory and System on a Chip (SoC) as well as in certain Storage Class Memory (SCM) applications.

While the technology will be applicable to many existing application areas, such as Automotive, Industrial, mobile devices, data centers etc, we believe SiOx ReRAM will also be extremely useful in edge computing, i.e. in Internet of Things (IoT) applications that increasingly require edge computing in order to minimize data transmission requirements of the IoT devices.

Next stop: Kb and Mb arrays at 40nm

WBT also mentioned that it will now be working towards SiOx ReRAM Kb and Mb arrays. Given that the company has already achieved 4Kb arrays at

Number of shares (m)	1391.0
Number of shares FD (m)	1539.6
Market capitalisation (A$ m)	105.7
Free Float (%)	59%
12 month high/low A$	0,082/0,014
Average daily volume (k)	3,120



Flash Note

Weebit Nano Ltd. (ASX:WBT)

Semiconductors & Semiconductor Equipment

Australia

Risk: High

Founded in Israel in 2015, Weebit Nano Ltd (WBT) is developing a newly emerging computer memory technology that combines the best of today's mainstream memory technologies, i.e. DRAM and Flash memory. Non-volatile like Flash and nearly as fast as DRAM, WBT's SiOx ReRAM will likely be able to complement and partially replace DRAM and Flash if and when the technology can be

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BUY

Current price: A$ 0.076

Price target: Under Review

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300nm (see below), we believe achieving Kb arrays, and subsequently Mb arrays, at 40nm will be a relatively straightforward process which the company expects to achieve in the first half of 2018.

Scaling down below 40nm

The company also stated it is currently defining its technology roadmap beyond 40nm, i.e. the company will be looking to scale down SiOx ReRAM further. In our view, the next logical step will be 28nm, which has been a technology development node for both logic and DRAM chips in the past. The 28nm resolution node would demonstrate further scalability of SiOx ReRAM and would bring the resolution more in line with today's trailing edge logic and DRAM resolutions. Potential further scaling would take the resolution to 20nm and below, and hence more suitable for SOC and embedded memory applications. However, we believe scaling to 20nm is not currently on WBT's development roadmap and may actually be work that will be undertaken by a future licensee of the technology.

Classification of 4Kb arrays at 300nm successfully concluded

Earlier in November WBT announced strong data retention and endurance results on a number of 4Kb arrays of memory cells at a 300 nanometer (nm) resolution. Data retention was tested and characterized under various temperatures to simulate typical soldering heat profiles. Additionally, using accelerated tests at different temperatures and extrapolation, WBT also conducted test to predict how long these memory cells are likely to retain their stored data. The tested Kb arrays were characterized as having data retention capabilities of ten years above room temperature, which is sufficient for the vast majority of future applications of the technology.

WBT also characterized the endurance profiles of the 4Kb arrays, i.e. how many times cells can be switched (programmed and erased). The company didn't disclose exact endurance data, but stated that endurance results were significantly higher than the program/erase cycling of existing Flash technology. PE cycles for existing Flash memory chips are typically 1,000 cycles for MLC and up to 10,000 cycles for SLC.

We expect endurance for SiOx ReRAM to be comparable to other emerging ReRAM technologies, i.e. approximately 100,000 cycles, which will be more than sufficient for SCM applications, data centers in particular.

Tapping into the Tech agglomeration in Grenoble, France

WBT also recently announced it has set up a French subsidiary to benefit from the local incentives for high tech companies and to roll out the industrialization of its technology. The highly successful cooperation with Leti was another reason for WBT to open this subsidiary in France.

Government incentives for technology companies in France include R&D tax credits (up to 60% of R&D expenses) and depreciation allowances. Additionally, WBT will be allowed to claim credits on certain employment costs, such as for researchers. For instance, tech companies can claim 120% of wages for young PhD's, which stimulates hiring of young scientists.

Apart from financial advantages, we believe the main benefits of a French subsidiary for WBT will be the company's ability to tap into the high-tech agglomeration in and around Grenoble, France. There are several high-tech agglomerations in Europe with a strong link to the semiconductor industry, such as Eindhoven in The Netherlands, Leuven in Belgium and Grenoble in France.

In our view, WBT should be able to generate synergies by being in close proximity to many of the relevant players in the memory industry, including manufacturers, designers, IP developers,

semiconductor specific software companies etc, as well as the rich talent pool of engineers and technicians.

Buy rating reiterated, price target under review

Scaling down to the 40nm resolution, in a relatively short time frame, while maintaining performance levels seen at 300nm is a major achievement for WBT and is significant in several ways.

Firstly, 40nm is the current resolution for 3D NAND Flash and achieving this puts SiOx ReRAM at par with Flash.

Secondly, achieving 40nm resolutions provides a solid base for WBT to engage in strategic discussions with semiconductor industry players, e.g. for development collaboration, especially once Kb arrays are achieved, which we expect early in 2018.

We believe such discussions with industry players, and the potential for licensing agreements following from these discussions, will be a key driver of the share price going forward. Therefore, we reiterate our BUY recommendation for WBT.

Since our A$ 0.07 price target has been reached, we have placed our price target under review.

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